

U.S. Patent Application Serial No. 10/765,887
Amendment filed March 2, 2005
Reply to OA dated December 2, 2004

REMARKS:

Claims 17 and 18 are currently being considered, of which claim 17 has been amended. Claim 18 stands allowed. No new claims have been added. Applicants believe that no new matter has been introduced.

Claim 17 stands rejected under 35 USC 102(b) as anticipated USP 5,910,756 (Ella).

Applicants respectfully traverse this rejection.

Claim 17, as amended, sets forth a film bulk acoustic resonator which comprises a support substrate, a base layer and a resonator assembly. The support substrate is made of a first material. The base layer is formed on the substrate and made of a second material which differs from the first material. The resonator assembly is provided on the base layer. The resonator assembly includes a lower electrode, an upper electrode and a piezoelectric member disposed between the upper and the lower electrodes. A first space portion is formed only in the base layer between the lower electrode and the support. A second space portion which is larger than the first space portion is formed only in the base layer in communication with the first space portion.

As shown in Figs. 2E and 2F, a space 19 is formed only in a base layer 12 which in turn is formed on a substrate 11. The substrate 11 is made of Si (as a first material) for example, whereas the base layer 12 is made of MgO (as a second material) for example.

Therefore, by using an etchant for selectively etching MgO alone, it is possible to form the space 19 only in the base layer 12. This is advantageous for accurately controlling the depth of the space 19.

As clearly shown in Fig. 1D, the space 19 results from merging of two circular space portions (due to etching which starts near two through-holes 18 shown in Figs. 1C and 2D). Therefore, the resulting space 19 has a smaller (or narrower) intermediate portion immediately under the resonator assembly 16, and a larger (or wider) end portion at each end of the space.

Claim 17, as amended, sets forth the structure shown in Figs. 1D and 2F.

In the resonator structure of **Ella** (Figs. 1a and 5a), a space 34 (which the Examiner considers as the equivalent of the claimed first space portions) is formed in the substrate 36, whereas etch windows 40a, 40b (which the Examiner considers as the equivalent of the claimed second space portions) are formed in a membrane 28 (including two layers 38a, 38b). Apparently, it is difficult to control the depth of the space 34. Further, each etch window is clearly smaller than the space 34.

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According to the invention defined in claim 17, as amended, both of the first space portion and the second space portion are formed only in the base layer but not in the substrate which carries the base layer. Further, the second space portion is larger than the first space portion.

Thus, Applicants respectfully submit that this rejection should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, all claims currently being considered are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,
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